

A WAY TO TRAIN DIGITALLY PROFICIENT SOLDIERS

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Introduction

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is identifying the best ways to train for digital system competency for the Army. The goal is to meet the Army's transition requirements: produce multiskilled, adaptable, and digitally proficient soldiers who are better able to move to an assignment and support the commander using existing systems.

In Fort Huachuca, AZ, training research at an Army school involved in digitization indicates that exploratory or discovery learning is a powerful method for teaching digital skills to novices. When used in the proper environment with trained instructors, this method improves how well soldiers transfer what they learn to novel situations. The methodology is not new. It has been successfully used in education and business where the workforce is regularly trained in digital technology to become current and stay competitive.

What Is Exploratory Or Discovery Learning?

In simple terms, exploratory or discovery learning teaches students to focus on real-world problem solving to master specific tasks and functions. Students learn by working with each other, using actual equipment, and listening to almost no lectures. Students solve problems with help from training aids, other team members, and instructors. They gain a better understanding of the material, learn it faster, and retain it longer than with traditional instruction.

What is good training? Typically, people learn best when they are challenged, motivated, and have opportunities to learn and develop by taking initiative. Think about your best learning experience ever. Who was the trainer? Was it your parent, a teacher, a sergeant? What was the environment? Were you at home, work, in the field, or in a classroom? How did the learning take place? Did

someone direct your every move? Were you trying to figure out something that was important to you? Why was this such a great learning experience?

In today's Army, there are many examples of soldiers mastering complex training competencies using a "train as you fight" model. From firing weapons to performing preventive vehicle maintenance, soldiers perform daily duties using this training method. For example, the *Washington Post*, June 12, 2000, discussed exploratory learning in Army Ranger training. Twenty-two captains trained using simulated real-world situations. They honed their skills by using exploratory or discovery learning to train in the way they would fight. Taking this method into the schools is a further extension of such practice. Instructors can teach the same information using the same standards in the time allocated but in a manner more in keeping with use in the field.

As the Army becomes more digitized, imagine some of the training possibilities for soldiers going through Advanced Individual Training (AIT) at the various Army schools around the country. The newest soldiers could be exposed to training that would simulate the actions needed in actual assignments. For example, a young soldier training in his tank at Fort Knox, KY, could transmit a spot report that would be received by an intelligence analyst at Fort Huachuca, who could then relay targeting information to an artilleryman training at Fort Sill, OK. Think of the training value of information flowing through a tactical operations center to a fire support element! It would be done digitally and involve innovative training practices. This is happening now at Fort Huachuca.

Fort Huachuca's Experience

The U.S. Army Intelligence Center (USAIC) at Fort Huachuca, with assistance from ARI, is investigating exploratory learning for junior-level soldiers and digital sys-

tem users. Preliminary indications show that AIT enhances digital skills training. At USAIC, junior-enlisted soldiers receive advanced individual training to become intelligence analysts (military occupational specialty (MOS) 96B10). As part of this training, they are expected to learn how to operate and refine analysis skills on the remote workstation (RWS), part of the All Source Analysis System. The RWS is a computer system that receives digital information, allows it to be manipulated, and displays it on a computer screen.

Traditional Learning

In a traditional training environment, the instructor uses lectures to explain what 96Bs need to accomplish with the RWS as well as its importance. This highly detailed and time-honored approach tells each 96B the necessary knowledge and information to perform the tasks. A traditional training environment focuses on an instructor delivering a set training program on how to operate the RWS. This program may or may not be linked to the other tasks the 96Bs must perform to take advantage of the systems' functionality. For example, can a 96B, using the RWS, successfully assist in the targeting process of the fire support element?

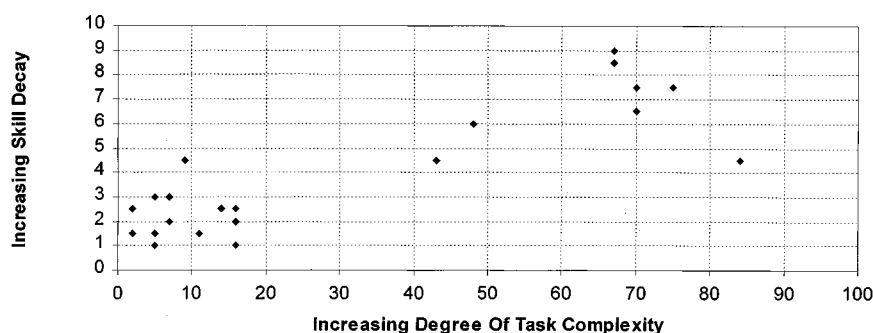
The benefit of using the traditional method of instruction is that a great deal of information is delivered to many soldiers in a very short time. Unfortunately, research has revealed a significant problem. Lectures do not result in sustained proficiency in the most difficult and complex tasks. Performance of these tasks degrades most rapidly after a soldier leaves training. As indicated in the accompanying figure, the skills used in accomplishing the most complex tasks decay faster than the skills needed to accomplish the least difficult tasks.

What can we do to increase skill retention? USAIC and ARI found that training with the exploratory or discovery learning method can make a big difference.

Illustrating The Method

The first step with the 96B10s was to deliver basic information, such as powering up and initializing the equipment, where there was no room for error. This was done in a lecture. The course changed rapidly with the principal training time spent on a series of practical exercises (PEs). These PEs emphasized problem solving to accomplish all required tasks including those that were complex and difficult. The PEs built upon each other and prior learning in the course, and 96Bs were encouraged to work in small teams and find innovative ways to use and

Relationship Between Skills Decay And Task Complexity



manipulate data. When one part of the practical exercise was completed, students briefed the instructor and were allowed to move forward at their own pace. No training time was added to the instruction program. Rather, the training time already set aside for traditional instruction was dedicated to the same material using exploratory or discovery learning. The responsibility for learning shifted from the instructor to the student.

Instructor's Role

The instructor's role remains a critical link in student-centered learning. After furnishing basic information, the instructor must coach, make suggestions, and provide insight about how to address difficulties that arise during PEs. The instructor combines subject matter knowledge with positive coaching techniques to shape and dramatically enhance performance. The challenge is to facilitate the learning experience.

Traditionally, the instructor answers questions and provides solutions to soldiers in training. However, that technique does not encourage soldiers to gain experience needed for solving problems. Exploratory learning is different. For example, when a soldier has difficulty framing a problem regarding the danger posed by the enemy, the instructor coaches the student to think through the problem. The instructor says something like, "It sounds to me like you're trying to determine what enemy assets pose the greatest threat to your unit. What are some of the things you look for to determine threat?" This type of coaching helps the student clarify the problem and gather information to solve it.

The Payoff

ARI research indicates that 96Bs who completed PEs using exploratory learning strengthened the connection between training

and how to apply it. Student performance on a novel PE was assessed after traditional instruction and exploratory learning with the RWS. Those using exploratory learning achieved up to 20 percent more accurate performance (determined by the number of tasks correctly performed). The practical exercises improved motivation because they were structured to place the training in a real-world context. Because the 96B graduates were encouraged to work with each other, they developed a sense of team collaboration as they defined and solved problems. This encouraged self-learning, teamwork, and improved memory for skills being developed. The 96Bs can better adapt and transfer their training to the myriad of situations they will face in unit assignments. This becomes a building block for how to apply technology from basic intelligence staff functions to staff operations in the field.

Student comments indicated positive reaction to exploratory learning. The method challenged them and generated strong motivation to learn. By teaming with other 96Bs, the students said that they learned and retained much more information.

Conclusion

Exploratory or discovery learning may not be the best learning method in every environment and MOS. However, it seems almost mandatory for any MOS that requires exchanging ideas, justifications, information, data, and specifications to confirm or refute conclusions. An ever-increasing number of MOSs will require these skills in the Army's transition and the fielding of digital systems. ARI has begun to work with field artillery training personnel on the Advanced Field Artillery Tactical Data System at Fort Sill. The same kinds of digital system requirements are evident there as at Fort Huachuca.

Practical exercises are building blocks of exploratory and discovery learning. They enable soldiers to work as a team while they define problems and develop solutions. This method is not intended to create experts, but rather to be a strong experiential learning foundation for novices. Soldiers are given the opportunity to learn and make mistakes in a safe learning environment. They learn from those mistakes before being assigned to units and deployed around the world. Then, as they gain experience in their unit assignment, they are better prepared to build on the foundation and, at a faster rate, mature and develop into experts who can successfully accomplish Army missions.

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